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09/121,152	07/22/1998	STEVEN SAY-KYOUN OW	EDT101con	2999
23579 7590 06/27/2007 PATREA L. PABST PABST PATENT GROUP LLP 400 COLONY SQUARE, SUITE 1200 1201 PEACHTREE STREET ATLANTA, GA 30361			EXAMINER HUG, ERIC J	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/121,152  
Filing Date: July 22, 1998  
Appellant(s): OW ET AL.

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Patrea L. Pabst  
For Appellant

**SUPPLEMENTAL EXAMINER'S ANSWER**

This is in response to the appeal brief filed January 11, 2007 appealing from the Office action mailed May 9, 2006 as well as responsive to the telephone discussion with applicant's representative, Ms. Pabst, in June 2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

Appeal No. 92-3394 (in Applicant Serial No. 07/518,935, filed May 4, 1990), before the Board of Patent Appeals and Interferences, decision rendered on March 10, 1994.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

It is noted, however, that claim 47 depends on a cancelled claim (claim 41) and as stated in footnote 2, on page 11, of the Brief it is indicated that the appeal as to claim 47 has been withdrawn and that claim 47 will be canceled at the conclusion of these appeal proceedings thus claim 47 will not be addressed further in this Examiner's Answer.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

1. Claims 21-25, 27, 30, 31, 33, 34, 36, 37, 40, 42-46, 49, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 59-9299.
2. Claims 26, 32, 35 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 59-9299 as applied to claims 21 and 31 above, and further in view of Fuentes et al (US 4,923,565).
3. Claims 28 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 59-9299 as applied to claims 21 and 31 above, and further in view of Hageman et al (US 4,548,674).

The changes above reflect the correction of certain errors propagated by a previous examiner during prosecution:

- a). Claim 41, canceled by Appellant on February 16, 2006, was rejected in the Office Action of May 9, 2006. Claim 41 has been removed from the current rejections.
- b). In the Office Action of May 9, 2006, independent claim 31 was improperly rejected as a dependent claim. It has been rejected along with independent claim 21 as given above.

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c). Upon further review of the rejections presented in Office Action of May 9, 2006, prior art references Fuentes and Hageman were not applied to all of the claims as indicated. The claims to which Fuentes and Hageman have been applied are now correctly identified. This does not constitute new grounds of rejection, but merely places the rejections in proper form for appeal.

Regarding claim 47, footnote 2, on page 11, of the Brief indicates that the appeal as to claim 47 has been withdrawn and that claim 47 will be canceled at the conclusion of these appeal proceedings thus claim 47 will not be addressed further in this Examiner's Answer.

#### **WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner:

The rejection of claims 27, 28, 37, and 48 under 35 U.S.C. 112, first paragraph, has been withdrawn.

#### **(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

#### **(8) Evidence Relied Upon**

JP 59-9299	Kao Soap Co. Ltd.	01-1984
US 4,923,565	Fuentes et al.	05-1990
US 4,548,674	Hageman et al.	10-1985

### (9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

1. Claims 21-25, 27, 30, 31, 33, 34, 36, 37, 40, 42-47, 49, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 59-9299.

With respect to independent claims 21 and 31, JP '299 discloses a method of de-inking waste or recycled printed paper, comprising pulping the waste paper with an enzyme in an aqueous medium, wherein ink is dislodged from the waste printed paper by action of the enzyme. The dislodged ink particles are subsequently removed from the waste paper pulp by methods such as flotation or rinsing. JP '299 discloses on page 2, last paragraph, that common enzymes of the type cellulase occurring in plants, animals, bacterial, and fungi can be used without special restriction. An **especially preferred** enzyme is alkaline cellulase which has an **optimum** pH of 8.0-11.5 (emphasis added), which range overlaps the endpoint of the claimed range of pH 3-8. Thus, being only a preferred embodiment, JP '299 does not restrict the pH to this range nor restrict the enzyme to an alkaline cellulase. In any event, see page 3, first line, which states that alkaline cellulase retains its activity within the acid and neutral pH range (i.e., pH=7 or less, clearly less than pH=8). Therefore, JP '299 suggests that at acid or neutral pH there is a reasonable expectation of success for using alkaline cellulase. For these reasons, at least part of the claimed pH range of 3-8, if not all, is deemed to be within the scope of JP '299.

JP '299 further discloses on page 4, second paragraph, that the enzyme can be added to the paper disintegration step, i.e., the pulping step. JP '299 does not disclose expressly that the

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pulping occurs at a pH between 3 and 8, however, it would have been obvious to one skilled in the art to pulp the waste paper at the same pH as desired for enzyme activity.

JP '299 further discloses an amount of enzyme to be used is above 0.002% by weight.

Example 1 discloses a dosage of 0.3%, which falls within the claimed ranges.

JP '299 further discloses a temperature of 45°C in Example 1.

JP '299 further discloses in Example 1 (page 4) pulping and de-inking at a pulp concentration of 6%. This is considered to be a high consistency relative to the consistency of pulp used for making paper (1% in the same example).

Other enzyme dosages, temperatures, and pulping consistencies are disclosed in subsequent examples, all of which fall within the claimed ranges.

All other claimed features are merely obvious characterizations of a de-inking process.

2. Claims 26, 32, 35, and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 59-9299 as applied to claims 21 and 31 above, and further in view of Fuentes et al (US 4,923,565). Regarding these claims, JP '299 does not disclose the particular species of cellulases. Fuentes discloses pulping fibers with cellulase enzyme added at a pH between 3 and 7 and in an amount of enzyme of 0.01 – 2% of the weight of the dry pulp (col. 3, lines 15-24). Fuentes discloses that preferred enzymes within this pH range are acid cellulases (col. 3, lines 36-43), which may include cellulases derived from the *Tirchoderma viridae* (col. 4, lines 47-52) or *Aspergillus niger* (col. 6, lines 40-43) microorganisms. At the time of the invention, it would have been obvious to one skilled in the art to use known acid cellulases as disclosed by Fuentes in the process of JP '299 at acid or neutral pH where such cellulases have the desired enzymatic

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activity, particularly when the pH is below the preferred activity range for alkaline cellulases.3.

Claims 28 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 59-9299 as applied to claims 21 and 31 above, and further in view of Hageman et al (US 4,548,674). With respect to claims 28 and 38, JP '299 does not disclose expressly that the wastepaper pulping consistency is about 12% or greater. Hageman discloses pulping wastepaper for de-inking at consistencies between 1-15% (col. 3, lines 19-30), and refers to this range as being a level of high consistency. The pulping consistency in JP '299 is within this range, therefore it can be considered a high pulping consistency. The claimed consistency is also within this range. Thus, it would have been obvious to one skilled in the art to choose a pulping consistency in JP '299 that yielded the best results. One would arrive at the claimed consistency via routine experimentation depending on the processing conditions and pulping devices used.

#### **(10) Response to Argument**

The rejection set forth above has been modified from its previous version in order to correct certain clerical errors and to clearly point out those features of the applied references the examiner regards as being relevant to the appealed claims.

Appellant's arguments and the supporting declarations have all been considered.

Appellant's admit (see page 12 of the Appeal Brief) that JP '299 "does describe a method of de-inking waste paper using a cellulase enzyme", "Any cellulose may be used" and that the "[a]lkaline cellulase...having optimum pH 8.0-11.5" is merely a preferred pH range. Appellant's also admit (see page 13 of the Appeal Brief) "that the examples of JP '299 are not limiting".

Appellant's argue that JP '299 constitutes a "teaching away" from the claimed invention, because JP' 299 teaches that the deinking method therein should be operated at a high alkaline pH, not at a pH between 3 and 8 as recited in the instant claims. The examiner does not dispute that the Examples in JP '299 are performed in the presence of 1% sodium hydroxide. Nor does the examiner dispute the statements made in the declarations pertaining to the high pH resulting from those additions of 1% sodium hydroxide. Because alkaline cellulase with an optimum pH range of 8.0-11.5 is used in the Examples of JP '299, it is reasonable to expect one to pulp the paper in the presence of the enzyme at an alkaline pH which is suitable for the enzyme's activity. However, as discussed in the rejections above and as admitted by appellant's, the use of alkaline cellulase is merely an "especially preferred" embodiment. The JP '299 reference is relied upon for all that it would have reasonably suggested to one having ordinary skill the art. The disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure including embodiments at acid or neutral pH. It is also noted that JP '299 clearly states (see page 2, last paragraph), "Cellulase commonly occurring in plants, animals, bacteria and fungi can be used in this invention without any special restriction, but alkaline cellulose is especially preferred." (emphasis added) which clearly suggests pH's within the claimed range of between 3-8. Thus, if one chose to use an acid or neutral cellulase rather than an alkaline cellulase, which is within the broader teachings of JP '299, then it is reasonable to expect one to pulp the paper in the presence of the enzyme at the same acid or neutral pH as the enzyme's activity.

Argument's pertaining to the combinations of references is not persuasive. It is recognized that Fuentes is not concerned with deinking. However, Fuentes is cited merely to

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illustrate what is known in the art regarding acid cellulases. One skilled in the art would look to prior art other than JP '299 to choose an enzyme suitable for deinking at acid or neutral pH. It is also recognized that Hageman does not teach deinking using an enzyme. However, Hageman is merely cited to show an exemplary range of pulp consistencies used in deinking, and to show that the claimed consistencies fall well within this range.

Appellant also argues (page 14 of the Appeal Brief) that a person skilled in the deinking art "would have read JP '299 as teaching that the de-inking method of the reference should be operated at a high alkaline pH, not at a pH between 3 and 8". As stated above and admitted by appellant's it is clear that the examples of the JP '299 are not limiting but merely preferred embodiments, as set forth in JP '299 it is clear that when taking the teach thereof as a whole it clearly suggests pH's within the claimed range of between 3-8 when pulping of waste papers as JP '299 clearly states (see page 2, last paragraph), "Cellulase commonly occurring in plants, animals, bacteria and fungi can be used in this invention without any special restriction, but alkaline cellulose is especially preferred." (Emphasis added)

Regarding appellant's statements (page 14 of the Appeal Brief) regarding the measurement of enzyme activity at pH=6.0 (page 5 of JP '299), and regarding the question of "if the enzymatic activity was measured at pH of 6.0, why were the examples operated at pH of 10-11?", without any information other than what is disclosed, it can only be speculated that measuring an enzyme's activity at pH 6.0 and 0.6 unit/mg solid is a standard test that does not take into account the enzyme type or operating pH. The operating pH differs because it corresponds to the choice of using an alkaline cellulase.

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It is further argued that Fuentes does not involve deinking and thus there would be no suggestion to combine it with JP '299, it is noted that Fuentes has not been relied upon to show deinking with an enzyme, this is disclosed in JP '299. JP '299 when combined with Fuentes specifically suggests that the pulping of JP '299 be performed under the claimed pH range with the motivation being to prevent denaturing the enzymes as recited in Fuentes thus there is a motivation to make the combination.

Appellant has submitted various arguments and statements regarding the declarations Mr. Howard Kaplan (I and II); Dr. Douglas Eveleigh (I and II); Mr. Schmid and Dr. Karl-Erik L. Eriksson (I and II). This evidence is discussed in the following paragraphs:

The Declarations of Dr. Eveleigh (filed 11/3/03 and 6/3/04) and Dr. Eriksson (filed 11/3/03 and 6/3/04) have been considered but are not deemed persuasive to overcome the prima facie case of obviousness.

With respect to the declarations of Dr. Eriksson, it is the opinion of Dr. Eriksson that the Japan '299 patent, read in its entirety, merely teaches one of ordinary skill in the art of the successful use of alkaline deinking with enzymes. Dr. Eriksson believes that despite the overly broad and unsupported statement made in Japan '299 that the deinking enzyme could retain its activity in the alkaline range as well as the acid or neutral range, that as of the priority date of May 16, 1989 combining that disclosure with the knowledge possessed by one of ordinary skill of the art would not generate an expectation for the successful use of enzymes for removing ink from pulp in a non-alkali environment in particular in a pH range of between 3 to about 8.

With respect to declarations of Dr. Eveleigh, it is Dr. Eveleigh's opinion that Japan '299 does not provide to those skilled in the art an expectation for the successful use of enzymes for

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removing ink from pulp in a non-alkali environment, despite the broad and unsupported statement that "any cellulase without restriction" may be used. It is Dr. Eveleigh's opinion that this is true because Japan '299 only provides actual data for embodiments of deinking newspapers in alkaline conditions in Examples 1-3.

Regarding the declarations of Dr. Eriksson and Dr. Eveleigh it should first be noted that they do not present any comparison to the closest prior art. They are drawn to the opinions of Dr. Eveleigh and Dr. Eriksson, that when JP '299 refers to "as well as the acid or neutral range" it is the conditions under which the enzyme may be purified. However, JP '299 states "Such enzyme retains its activity in the alkaline range as well as acid or neutral range... ". It is considered that the retaining of the activity of an enzyme is a property of the enzyme itself, e.g. retained after formation and purification, it is not the conditions used to purify the enzyme. The statement in the Dr. Eriksson declaration that the Paper and Pulp International (PPI) article entitled "Neutral Deinking Makes Its Debut" is describing the breakthrough of the first neutral deinking is not convincing for the following reasons:

- (1) The claims are not limited to neutral deinking and include acid deinking (pH 3.0 to less than 7.0) and alkaline deinking (pH greater than 7.0 to less than 8.0).
- (2) The article states that "the first neutral deinking system began its operation in July of 1992". However, it does not indicate that the technology was not known earlier.
- (3) The article states that "the first neutral deinking system began its operation in July of 1992". This is more than a year earlier than the effective dates of claims 26 and 35.
- (4) The use of a cellulase having activity in the neutral and acid range is obvious from the teachings of JP '299 as discussed above.

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Regarding the declaration of Mr. Schmid (filed 6/3/04), Mr. Schmid states that it is his understanding and belief that the Zwingen mill in Zwingen, Switzerland was the first in the world intended to be built and run on a neutral deinking concept. According to Mr. Schmid there was no suggestion of non-alkali deinking at the Zwingen plant prior to 1991. Regarding the declaration of Mr. Schmid it is noted that it fails to provide a discussion of the closest prior art, the JP '299 reference, and when considered with respect to the prior art and rejections applied is not persuasive to overcome the prior art rejections.

Regarding the declaration of Mr. Howard Kaplan (filed 6/22/05), Mr. Kaplan appears to be suggesting that the method recited in the instant claims provide unexpected results as compared to the JP '299 disclosure. It is considered that the information provided in the Kaplan declaration is not persuasive to overcome the rejections over JP '299. First it is noted that the Kaplan declaration fails to compare the instant invention to the portion of JP '299 which renders the instant claims unpatentable, the portion of JP '299 (as discussed in the rejection above) which clearly suggests pulping of waste paper as pH's between 3 and 8. Further it is noted that the Kaplan declaration is not commensurate in scope with the claimed subject matter as the only tested sample appears to be at a pH of 7.2 whereas the claims encompass a range of pHs of 3-8. It is further noted that the tests of Kaplan show only a .7% difference in whiteness in the resulting paper, there is no indication that this difference would provide any statistical significance and as such is actually unexpected. It is further alleged that the NaOH swelled the fibers of the comparative sample but not data was provided to demonstrate the amount of swelling obtained. It is also noted that it is not seen how a single preferred embodiment given by way of example in JP '299 at a pH outside of the claimed range necessarily teaches away from

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the claimed range when the general disclosure of JP '299 overlaps the claimed range. If anything, the work by Mr. Kaplan supports an expectation of success at the lowest pH disclosed by JP '299. Further regarding the declarations by Dr. Eriksson, Dr. Eveleigh, and Mr. Schmid, the consensus opinion of these declarations is that no one skilled in the art would have considered enzymes alone without the addition of alkalis, and that there is no basis in JP' 299 for successful use of a cellulase deinking enzyme at a pH of about 3 to about 8. These arguments are in relation with those discussed above, and therefore do not need to be further addressed.

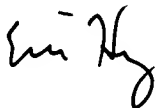
**(11) Related Proceeding(s) Appendix**

Copies of the court or Board decision identified in the Related Appeals and Interferences section of this examiner's answer have been provided by Appellant in the Appeal Brief.

For the above reasons, it is believed that the rejections should be sustained.

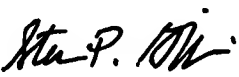
Respectfully submitted,

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